

Listing of the Claims

1. (Presently Amended) A method of optical spectroscopy comprising:
directing a light pulse having a first pulse duration to a detection volume,
receiving a return radiation signal, the return radiation signal having a first signal component having a second pulse duration, the second pulse duration being substantially similar to the first pulse duration, and one or more second signal components,
reducing of the second signal component in the return radiation signal, and
performing of a spectroscopic analysis of the return radiation signal.
2. (Currently Amended) The method of claim 1, the first pulse duration being below 10 picoseconds, ~~preferably between 0.5 picoseconds and 3 picoseconds.~~
3. (Currently Amended) The method of claim 1 ~~or 2~~, the light pulse being provided by a pulsed laser source.
4. (Currently Amended) The method of claim 1, ~~2, or 3, wherein the elimination reduction of the second signal component being is performed by delaying part of the return radiation signal, thereby providing a delayed return radiation signal and an undelayed return radiation signal.~~
5. (Currently Amended) The method of ~~any one of the preceding claims 1 to 4, wherein~~ the reduction of the second signal component ~~being is~~ performed by the steps of:
adding the undelayed return radiation signal and the delayed return radiation signal to provide a first signal,
providing a second signal by adding the undelayed return radiation signal and the delayed return radiation signal, and inverting the resulting signal after arrival of the first signal component,
adding the first and second signals.
6. Currently Amended) The method of ~~any one of the preceding claims 1 to 5, wherein~~

the reduction of the second signal component ~~being~~ is performed by time gating using the timing of the light pulse as a reference.

7. (Currently Amended) The method of ~~any one of the preceding claims 1 to 6, wherein~~ the reduction of the second signal component ~~being~~ is performed by directing a sequence of the light pulses to the detection volume with a first frequency, and using a frequency selective amplifier for reduction of the second signal component.

8. (Currently Amended) The method of ~~any one of preceding claims 1 to 7, wherein the~~ second signal component ~~being~~ is a luminescence, in particular fluorescence; signal component and/or background radiation.

9. (Currently Amended) An apparatus for optical spectroscopy comprising:

means ~~(102; exe)~~ for directing of a light pulse having a first pulse duration to a detection volume ~~(108)~~, the light pulse causing a return radiation signal having a first signal component and one or more second signal components, the first signal component having a second pulse duration being substantially similar to the first pulse duration,

means ~~(114; gp, ph, phe, spet)~~ for reducing of the second signal component of the return radiation signal,

means ~~(104; spet)~~ for performing of a spectroscopic analysis of the return radiation signal.

10. (Original) The apparatus of claim 9, the pulse duration being below 10 pico seconds, ~~preferably between 0.5 pico seconds and 3 pico seconds.~~

11. (Currently Amended) The apparatus of claim 9 ~~or 10~~, further comprising a pulsed laser source for providing a sequence of the light pulses, the pulsed laser light source being optically coupled ~~(gp, ph)~~ to the means for reducing of the fluorescence component to provide a time reference.

12. (Currently Amended) The apparatus of claim 9, ~~10 or 11~~, further comprising photon counting means ~~(phe)~~ for detecting the light pulse in order to provide a time reference for the means for reducing and for receiving of the return radiation to provide the return radiation signal.

13. (Currently Amended) The apparatus of ~~any one of the preceding claims 9 to 13~~, comprising optical means ~~(308, 310)~~ for delaying part of the return radiation in order to provide a delayed return radiation signal ~~(118)~~ for elimination of the second signal component.

14. (Currently Amended) The apparatus of ~~any one of the preceding claims 9 to 13~~, further comprising electronic means for delaying part of the return radiation signal for eliminating of the second signal component.

15. (Currently Amended) The apparatus of ~~any one of the preceding claims 9 to 14~~, wherein the means for performing of a spectroscopic analysis ~~being adapted to performs~~ Raman spectroscopic analysis.

16. (Currently Amended) The apparatus of ~~any one of the preceding claims 13 9 to 15~~, further comprising means ~~(124)~~ for multiplication of the undelayed return radiation signal ~~(116)~~ by a scaling factor.

17. (New) The apparatus of claim 14 further comprising means for multiplication of the undelayed return radiation signal by a scaling factor.

18. (New) An apparatus for optical spectroscopy comprising:
a pulsed light source generator that provides an excitation light source directed towards a detection volume;
a means for directing return radiation from the detection volume towards a

spectrometer; and

a means for filtering out fluorescence from the return radiation using a time reference provided by the light source.

19. (New) The apparatus of claim 18, wherein the means for filtering out the fluorescence uses the time reference to create a delayed return radiation signal and creates a second signal that is the sum of the delayed return radiation signal and an undelayed return radiation signal; wherein the second signal is used for spectroscopic analysis.

20. (New) The apparatus of claim 19 wherein the second signal includes a negative portion and the negative portion is used for spectroscopic analysis.

21. (New) The apparatus of claim 18, wherein the radiation return signal includes an undelayed radiation return signal and a delayed radiation signal; and wherein the delayed radiation signal and the undelayed radiation signal are combined to form a combined signal.

22. (New) The apparatus of claim 21, wherein the combined signal is split into a first combined signal portion and a second combined signal portion; wherein the apparatus includes means for switching the polarity of one of the first combined signal portion and the second combined signal portion after a time equal to the time reference.

23. (New) The apparatus of claim 22, wherein the switched combined signal portion and the other combined signal portion are added to provide a signal for spectroscopic analysis.